



# The relationship between intellectual capital, firms' market value and financial performance: empirical evidence from Bangladesh

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## General Note



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## ABSTRACT

This paper examines to investigate the empirically the relation between the value creation efficiency and firms' market valuation and financial performance by using data drawn from 22 banks enlisted in the DSE. By using Pulic's Value Added Intellectual Coefficient as the efficiency measure of capital employed and intellectual capital, also examines the relationship between corporate value creation efficiency and firms' market-to-book value ratios, and explores the relation between intellectual capital and firms' financial performance. Correlation and regression analysis have been conducted on the collected data. The results, although do not show any strong association between the studied variable, extend the understanding of the role of intellectual capital in creating corporate value and building sustainable advantages for companies in emerging economies, where different technological advancements may bring different implications for valuation of intellectual capital.

**Keywords:** Intellectual Capital, Firm's Market Value, Financial Performance.

**JEL Classification:** G21

## 1. INTRODUCTION

Banking sector, considered as ever growing child, in any country plays a pivotal role in setting the economy in motion and in its development process, while the banking structure the number and size distribution of banks in a particular locality and the relative market power of specific banking institutions - determines the degree of competition, efficiency and performance level of the banking industry (Azad, 2000). Bangladesh's banking sector consists of central bank (named as Bangladesh Bank), Commercial banks, Development Banks and Specialized Financial Institutions. The Commercial banks comprise of Nationalized Commercial Bank (NCB), Local Private Bank, Foreign Private Bank, and Islamic Bank. In recent years, it is observed a mushroom growth in the banking sector in Bangladesh. The very active and boisterous presence of private sector has stirred competition among the traditional commercial banks. The shadow of fierce competition in banking industry can be observed through the recent achievement of the private commercial banks. Despite sharing only 23 percent of total branch network, private commercial banks (PCBs) for the first time in Bangladesh banking history have overtaken nationalized commercial banks (NCBs) in terms of deposit and credit disbursement in 2004 (Byron, 2005). September 2005, share of the NCBs on total loan disbursement was about 37 per cent, whereas PCBs grabbed 48 per cent during the period under review ("PCBs overtake NCBs in deposits, credit market." 2005). In a similar vein, PCBs' share on total deposits stood September 2005, share of the NCBs on total loan disbursement was about 37 per cent, whereas PCBs grabbed 48 per cent during the period under review ("PCBs overtake NCBs in deposits, credit market." 2005).

## 2. PROBLEM STATEMENT

Growing gap between the market and book values of firms, investigation into how to measure firms' intellectual capital and whether capital market is efficient with intellectual capital has been drawing broad research interest (Chen, Cheng, & Hwang, 2005). If intellectual capital does not exist in organizations then why does stock price react to changes in management? Obviously, investors and financial markets attach value to the skills and expertise of CEOs and other top management (Bontis, 2001). Recent contributions have suggested that knowledge and information are actually subject to increasing returns, as opposed to the decreasing returns typical of the traditional resources (Bontis, Dragonetti, Jacobsen, & Roos, 1999). If this is true, then knowledge and information become even more attractive to companies than before. Having a good base of knowledge means that a company can in future years start leveraging that base to create even more knowledge thus increasing its advantage on the competitors (Arthur, 1996). Now question arises how the companies can use accounting tools, developed 500 years ago to help merchants in the feudal era, to make the key success factors of the information age visible. Unfortunately, knowledge is invisible and intangible, and thus it is not captured very well by any of the traditional measures, accounting or otherwise, that corporations master in their everyday operations. By modeling sales as a function of a firm's organizational capital, net fixed assets, number of employees, and R&D capital, Lev and Radhakrishnan (2003) developed a firm-specific measure of organization capital.

Using a sample of approximately 250 companies, they showed that organizational capital estimate contributes significantly to the explanation of the market values of firms, beyond assets in place and growth potential. Similar to the concept of Skandia Navigator (see Bontis et al., 1999), Pulic (2000a, 2000b) depicted firms' market value as created by capital employed and intellectual capital, which consists of human capital and structural capital. He proposed the Value Added Intellectual Coefficient (VAIC) method to provide information about the value creation efficiency of tangible and intangible assets within a company. Instead of valuing the intellectual capital of a firm, the VAIC method mainly measures the efficiency of firms' three types of inputs: physical and financial capital, human capital, and structural capital, namely the Capital Employed Efficiency (CEE), the Human Capital Efficiency (HCE), and the Structural Capital Efficiency (SCE). The sum of the three measures is the value of VAIC. Higher VAIC value suggests better management utilization of companies' value creation potential. Using data from 30 randomly selected companies from the (UK) FTSE 250 from 1992 to 1998, Pulic (2000b) also showed that the average values of VAIC and firms' market value exhibit a high degree of correspondence.

Although much IC research has been conducted in a variety of international settings including the UK (Roos et al., 1997), Scandinavia (Edvinsson & Malone, 1997), Australia (Sveiby, 1997), Canada (Bontis, 1996; 1998; 1999), Austria (Bornemann, 1999) and the USA (Stewart, 1997; Bassi & van Buren, 1999) none seems to have been made in Bangladesh. Hence, this study intends to explore the relationship between Value Added Intellectual Coefficient (VAIC), firms' market valuation (Market – to – book value ratios) and financial performance in context of banking industry of Bangladesh.

## 3. OBJECTIVES OF THE RESEARCH

The prime objective of this study is to empirically examine the association between a developing measure of intellectual capital – namely the *Value Added Intellectual Coefficient* (VAIC) developed by Pulic (1998) and market – to – book value ratios. Following

Chen, Cheng, and Hwang (2005), Firer and Williams (2003), and Goh (2005), this study also uses VAIC as an aggregate measure of corporate intellectual ability. Further, this study also analyses whether intellectual capital contributes to firms' financial performance: (1) return on equity, (2) return on assets, (3) growth in revenue, (4) employee productivity. Findings from this study will assist to determine if Bangladeshi firms appear to continue to rely on traditional business practices and perceptions (that is, a reliance on natural resources for wealth creation) or are shifting towards a greater reliance on intellectual capital factors of production in determining productivity, profitability and market valuation. This study will also assist to discover the investors' perception on corporate performance and to determine the factors, which they value more while investing their money. Hence, the purpose of this initial stage of research is to aid the development of a relationship rather than approaching towards a robust conclusion.

#### 4. LITERATURE REVIEW

Knowledge and information are nowadays the drivers of company life, much more so than and, capital or labor. What does this mean for managers? The increased importance of knowledge does not simply add an additional variable to the production process of goods: it changes substantially the rules of the game. The capacity to manage knowledge-based intellect is the critical skill of this era (Quinn, 1992). The wealth creating capacity of the enterprise will be based on the knowledge and capabilities of its people (Savage, 1990). Even management guru Drucker (1993) declares the arrival of a new economy, referred to as the "knowledge society". He claims that in this society, knowledge is not just another resource alongside the traditional factors of production – labor, capital, and land – but the only meaningful resource today (Bontis, 2001).

There are numerous definitions for intellectual capital since the beginning of its research in the early 1980s. Itami (1987), the pioneers who published works on intellectual capital, defined intellectual capital as intangible assets which includes particular technology, customer information, brand name, reputation and corporate culture that are invaluable to a firm's competitive power. Stewart (1997) viewed intellectual capital as knowledge, information, intellectual property and experience that can be put to use to create wealth. Edvinsson (in Bontis, 2000) explained intellectual capital as applied experience, organizational technology, customer relationships and professional skills that provide a firm with a competitive advantage in the market. For Bontis (2000), intellectual capital means individual workers' and organizational knowledge that contributed to sustainable competitive advantage, while Pulic (2001) includes all employees, their organization and their abilities to create value added that is evaluated on market into intellectual capital. Again, Edvinsson and Malone (1997) define the difference between a firm's market value and book value as the value of intellectual capital. A firm's intellectual capital, in a broad sense, is comprised of human capital and structural capital (Bontis, 1996). Human capital is employee-dependent, such as employees' competence, commitment, motivation and loyalty, etc. Although human capital is recognized as being the heart of creating intellectual capital, a distinctive feature of human capital is that it may disappear as employees exit (Bontis, 1999). In contrast, structural capital belongs to firms, including innovative capital, relational capital, and organizational infrastructure, etc.

Despite the increasing recognition of intellectual capital in driving firm value and competitive advantages, an appropriate measure of firms' intellectual capital is still in infancy (Chen, Cheng, & Hwang, 2005). If knowledge is the key to future success, but is not adequately reflected in traditional accounting financial measures, and if financial measures are the main drivers of top management's decision making, what measuring system would fulfill the requirements of the new economy and the needs of modern companies? In answering this question, different measures have been developed in order to present the intellectual capability of the firms. Among those, Human Resource Accounting (HRA), Economic Value Added (EVA) approach, Balanced Score Card (BCS) are most discussed in the research arena. In this section of literature review, the above-mentioned IC measurement techniques would be discussed with the loopholes that refrain these measures to become a standardized one in the business world.

Using survey data, Bontis (1998) has already shown a very strong and positive relationship between Likert-type measures of intellectual capital and business performance in a pilot study. The explanatory power of the final specified model was highly significant and substantive ( $R^2 = 56.0\%$ ,  $p\text{-value} < 0.001$ ). In Malaysia, Bontis *et al.* (2000) found that IC has a significant and substantive relationship with business performance regardless of industry sector. Based on the resource-based and stakeholder views, Riahi-Belkaoui (2003) documented a significant positive relationship between intellectual capital and financial performance, using 81 US multinational firms.

While intellectual capital is generally intangible in nature, it is becoming widely accepted as a major corporate strategic asset capable of generating sustainable competitive advantage and superior financial performance (Barney, 1991).

#### 5. HYPOTHESIS DEVELOPMENT

Expecting it happens so in case of banking sector of Bangladesh, the researcher hypothesis the following:

*Hypothesis 3:* Companies with greater intellectual capital tend to have better financial performance, *ceteris paribus*.

*Hypothesis 4A:* Companies with greater physical capital efficiency tend to have better financial performance, *ceteris paribus*.

*Hypothesis 4B:* Companies with greater human capital efficiency tend to have better financial performance, *ceteris paribus*.

*Hypothesis 4C:* Companies with greater proportions of structural capital in the creation of value added, tend to have better financial performance, *ceteris paribus*.

## 6. RESEARCH METHODOLOGY

### 6.1 Research Design

The conceptual framework (Figure 1) illustrates the name of research variables and relationship within them. The hypotheses developed to be tested clearly support this model. In this study, the researcher is going to investigate the relationship between market-to-book value ratios, value added intellectual coefficient (VAIC) and its components, financial performance in context of banking industry of Bangladesh. Research that studies the relationship between two or more variables is also referred to as a correlation study (Cooper & Schindler, 2003). That is why a correlation research design has been adopted in order to test the hypotheses. The model (Figure 1) also suggests this type of design. Here, market-to-book value ratios (M/B), financial performance (ROA, ROE, GR, & EP) are considered as the dependent variable, whereas value added intellectual coefficient (VAIC) and its component capital employed efficiency (CEE), human capital efficiency (HCE), and structural capital efficiency (SCE) are considered as independent variable.

### 6.2. Sampling Method

A sample consists of 24 private commercial banks (PCBs) enlisted in the Dhaka Stock Exchange was, at first, selected. However, two PCBs have been omitted due to missing data. The number of employees in 2004 of Mercantile bank Ltd. was not found and market price of Pubali bank Ltd. was also not found in spite of intensive search in annual reports and respective websites.

### 6.3. Data Collection Procedure

The annual reports of the selected banks are only source of required data. Since the current study is of financial in nature, the financial statements and the subsidiary notes would be better of searching for information looked-for.

#### **Measures of variables Dependent variables:**

Market-to-book value ratios of equity (M/B):

M/B is measured by the market value divided by the book value of common stock: Market value of common stock = no. of shares outstanding  $\times$  stock price at end of the year Book value of common stocks = book value of stockholders' equity – paid-in capital of preferred stocks (2) Financial performance:

The four financial performance variables, following Chen, Cheng, and Hwang (2005), are defined as follows:

\* Return on equity (ROE) = pre-tax income  $\div$  average stockholders' equity

ROE represents returns to shareholders of common stocks, and is generally considered an important financial indicator for investors.

\* Return on total assets (ROA) = pre-tax income  $\div$  average total assets

ROA reflects firms' efficiency in utilizing total assets, holding constant firms' financing policy.

\* Growth in revenues (GR) = (current year's revenues  $\div$  last year's revenues) - 1  $\times$  100%. GR measures the changes in firms' revenues. Increases in revenues usually signal firms' opportunities for growth.

\* Employee productivity (EP) = pre-tax income  $\div$  number of employees

EP is a measure for the net value added per employee, reflecting employees' productivity.

#### **Independent variables:**

VAIC and CEE, HCE and SCE

VAIC has been used as a measure for corporate intellectual ability (Pulic, 2000b). Firer and Williams (2003) pointed out two advantages of VAIC, which were that VAIC provides an easy-to-calculate, standardized, and consistent basis of measure, enabling

effective comparative analyses across firms and countries; and data used in the calculation of VAIC are based on financial statements, which are usually audited by professional public accountants. The procedures calculating VAIC are as follows:

**Calculating value added (VA):**

$$VA = OUTPUT - INPUT \text{ ----- (i)}$$

Based on the stakeholder view (Donaldson & Preston, 1995), Firer and Williams (2003) adopted a broader definition in calculating VA. The stakeholder view maintains that any group that can affect or be affected by the achievement of a firm's objectives should have a "stake" in the firm. These stake groups include stockholders, employees, lenders, government, and society; therefore, in measuring firm performance, a broader measure of value added by stakeholders is better than accounting profit that only calculates returns to stockholders.

Consistent with Riahi-Belkaoui (2003), the calculation of value added can be expressed as equation (4):

$$R = S - B - DP - W - I - DD - T \text{ ----- (ii)}$$

Where: R is changes in retained earnings;

S is net sales revenues;

B is bought-in materials and services (costs of goods sold);

DP is depreciation;

W is wages (employee salaries);

DD is dividends;

and T is taxes.

Equation (ii) can be re-arranged as equation (iii) and (iv):

$$I. S - B = DP + W + I + DD + T + R \text{ ----- (iii)}$$

$$S - B - DP = W + I + DD + T + R \text{ ----- (iv)}$$

Equation (iii) is the gross value added approach, whereas equation (iv) is the net value added approach. The left-hand side of the equations calculates the gross (or net) value added, and the right-hand side of the equations represents the distribution of the value created by firms, including employees, debt-holders, stockholders, and governments. VA has been defined by Chen, Cheng, and Hwang (2005) as the net value created by firms during the year, and because DD plus R is equal to net income under the clean surplus assumption, equation (iv) can be expressed as follows:

$$VA = S - B - DP = W + I + T + NI \text{ ----- (v) where: NI is after-tax income.}$$

Being exploratory in nature, the current research sticks to the very foundation of VAIC model and thus intends to use the equation no. one for measuring value added.

**Calculating CE (capital employed), HU (human capital), and SC (structural capital):**

Following Pulic (2000 a, b), and Firer and Williams (2003), the three major components of firm resources CE, HU and SC are, by definition, as follows:

$$CE = \text{physical capital} + \text{financial assets} = \text{Total assets} - \text{intangible assets}$$

$$HC = \text{total expenditure on employees} \quad SC = VA - HC$$

Dividing firms' resources into CE and HU is consistent with the resource-based view of the firm (Riahi-Belkaoui, 2003). The resource-

based view of the firm maintains that firms' resources are the main drive behind competitiveness and firm performance. These resources include both tangible and intangible assets. CE is a proxy for firms' tangible resources and HU is a measure of major intangible resources.

### **Calculating VAIC and its three components**

By definition, the three components of VAIC are calculated as follows:  $CEE = VA \div CE$

$HCE = VA \div HU$

$SCE = SC \div VA$

Where: CEE is indicator of VA efficiency of capital employed; HCE is indicator of VA efficiency of human capital; SCE indicator of VA efficiency of structural capital.

CEE and HCE can be viewed as the value-added by a dollar input of physical assets and human capital, respectively. SCE represents the proportion of total VA accounted for by structural capital. Finally, VAIC is the sum of the three components of VA efficiency indicators.

### **Data Analysis**

After collecting the data, descriptive statistics have been shown to represent the general condition of the selected variables and then correlation matrix (Pearson's Correlational analysis) for the variables has been displayed in order to look for significant correlations among the variables. Correlation analysis is the statistical tool that can be used to describe the degree to which one variable is linearly related to another (Levin & Rubin, 1998). The researcher has also conducted regression analysis to test the strength of associations between the studied variables. The Statistical Package for Social Science (SPSS) software (version 10.0) has been employed to carry out the above analyses through using the data collected from the annual reports, since it offers greater flexibility and visualization.

## **7. RESULTS**

Table 1 presents descriptive statistics of all the variables concerning the current research. Descriptive statistics include mean, maximum limit, minimum limit, and standard deviation. The mean for Market – to – Book value ratios (2.11; sd = 2.1604) indicates that investors generally value the sample firms in excess of the book value of net assets as reported in the financial statements. M/B has mean of 2.11 means over 50% of banks' market value is not reflected on financial statements. Comparison of CEE (.086; sd = 0.0105), HCE (9.438; sd = 4.026), and SCE (.8728; sd = 0.055), suggests that during 2003-2004, the sample banks were generally more effective in generating value from its human capital rather than physical and structural assets.

**Table 1** Descriptive Statistics for Market to book value ratios, Return on Equity, Return on Assets, Revenue Growth, Employee Productivity, Human Capital Efficiency, Capital Employed Efficiency, Structural Capital Efficiency, and Value Added Intellectual Coefficient (VAIC)

	<b>N</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Mean</b>	<b>Std. Deviation</b>
<b>M/B</b>	22	-5.98	4.60	2.1100	2.1604
<b>ROE</b>	22	-.273	.743	.34	.209
<b>ROA</b>	22	-.0112	.051	0.021	0.014
<b>GR</b>	22	-.0481	.558	.163	.1553
<b>EP</b>	22	-367889.106	4316582.282	773269.632	960449.211
<b>HCE</b>	22	4.424	17.751	9.438	4.026

<b>CEE</b>	22	.0561	.1006	0.086	0.0105
<b>SCE</b>	22	.77	.94	.8728	0.055
<b>VAIC</b>	22	5.286	18.784	10.398	4.0824
<b>Valid N (list wise)</b>	22				

The findings are consistent with the prior research conducted by Firer and Williams (2003) on a sample of 75 publicly traded firms (using data from 2001 fiscal year annual reports) in South African business sector heavily reliant on intellectual capital as well as with the findings of Ho and Williams (2002), who also conducted their study on South African publicly traded firms based on data of the year 1999. Overall financial performance of the sample banks is quite sound although a bit lower Return on Assets (0.021; sd = 0.014) is observed. Again, the standard deviation of all the variables is observed a bit high. It is because a few banks (as Rupali Bank Ltd. and Oriental Bank Ltd.) are struggling in their financial issues (see Appendix – 1) and thus contributes to the overall results. Correlation analysis is the initial statistical technique employed to analyze the relationship between the dependent and explanatory variables. Findings from Pearson's correlations indicate HCE ( $r = 0.426$ ,  $p < 0.05$ ), CEE ( $r = 0.768$ ,  $p < 0.01$ ), SCE ( $r = 0.472$ ,  $p < 0.05$ ), and lastly value added intellectual coefficient, VAIC ( $r = 0.428$ ,  $p < 0.05$ ) are significantly positively correlated with M/B. It suggests the banks' market value is positively associated with corporate intellectual ability and its three components, human capital efficiency, capital employed efficiency, and structural capital efficiency.

**Table 2**

Correlation Matrix for Market to book value ratios, Return On Equity, Return On Assets, Revenue Growth, Employee Productivity, Human Capital Efficiency, Capital Employed Efficiency, Structural Capital Efficiency, and Value Added Intellectual Coefficient (VAIC)

	M/B	ROE	ROA	GR	EP	HCE	CEE	SCE	VAIC
<b>M/B</b>	-	.737 **	.528 *	.396	.449 *	.426 *	.768 **	.472 *	.428 *
<b>ROE</b>		-	.683 **	.392	.177	.235	.726 **	.234	.237
<b>ROA</b>			-	.556 **	.354	.369	.594 **	.337	.37
<b>GR</b>				-	.342	.664 **	.392	.620 **	.664 **
<b>EP</b>					-	.38	.243	.429 *	.382
<b>HCE</b>						-	.376	.942 **	1.000 **
<b>CEE</b>							-	.377	.379
<b>SCE</b>								-	.943 **
<b>VAIC</b>									-

Note: \* $p < .05$ , \*\* $p < .01$

However, except CEE, the rest of the explanatory variables are not significantly associated with ROE and ROA. On the other hand, HCE ( $r = .664$ ,  $p < 0.01$ ), SCE ( $r = .620$ ,  $p < 0.01$ ), and VAIC ( $r = .664$ ,  $p < 0.01$ ) are significantly positively correlated with GR, implying that only human capital with the prompt assistance of structural capital can ensure banks' future growth. The association between SCE and EP also supports such view. SCE ( $r = .429$ ,  $p < 0.05$ ) is significantly positively correlated, although moderate in nature, with EP depicting that lacking in apt structural capital might hamper employees' productivity and thus might lead to loss of revenue.

### Regression Analysis

Both stepwise and entered regressions have been conducted to review the relationship between the studied variables. Table 3A and 3B present the results of the regression analysis on dependent variable M/B.

**Table 3A** Standardized (simultaneous) Regression on Market – to – book value ratios

Independent Variables	Dependent Variable M/B			
	B	SE B	$\beta$	R <sup>2</sup>
<b>Panel 1</b>				
VAIC	.227	.107	.428 *	.183
<b>Panel 2</b>				
HCE	-.159	.227	-.296 *	.638
CEE	143.331	31.638	.695 ***	
SCE	19.034	16.470	.488	

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$

Table 3A represents the standardized regression on M/B, where VAIC ( $p < .05$ ) is statistically significantly related with M/B. However, value added intellectual coefficient, VAIC can only explain 18.3% variability in M/B. The aggregated results from correlation analysis and regression analysis tend to focus VAIC as a predictor of banks' intellectual efficiency and as such provide support to the hypothesis one, which implies companies with greater intellectual capital tend to have higher ratios of market-to-book value, *ceteris paribus*. This finding is consistent with the findings of Chen, Cheng, and Hwang (2005), who conducted their study on Taiwanese companies enlisted on the Taiwan Stock Exchange (TSE) during 1992-2002. The findings of their study concluded that investors place higher value on firms with greater intellectual capital. Table 3A also shows HCE ( $p < .05$ ) and CEE ( $p < .001$ ) are significantly related with M/B. It highlights the lack of dependency of the banks of Bangladesh on the formation of structural capital and as such the disregarding behavior of the investors to place value on banks' structural capital. Noticeably, the value of R<sup>2</sup> substantially increases from Panel 1 (R<sup>2</sup> = .183) to Panel 2 (R<sup>2</sup> = .638) depicting that the investors may place different value on the three components of VA efficiency, and thus the explanatory power for firm value in Panel 2 is substantially greater than in Panel 1.

**Table 3B** Stepwise Regression on Market – to – book value ratios

Independent Variable	Dependent Variable M/B			
	B	SE B	$\beta$	R <sup>2</sup>
<b>Step One</b>				
CEE	158.374	29.535	.768 ***	.590

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$

Further, stepwise regression has been shown in order to find out which one of the three components influences the investors while taking investment decision. Table 3B shows the result of the analysis. At this stage, CEE ( $p < .001$ ) is found to be significantly related with M/B, while the rest two (HCE & SCE) fail to be considered. It implies the investors still considers the physical capital of a bank while making their investment decision. The structural capital remains ignored, since the absence of state of the art technology prevailed in the industry. However, the recent trend in the banking sector of Bangladesh shows the use of internet banking, debit card, receiving bank statement through e-mail, Tele-banking etc. which somehow shows the further improvement of the



productivity of the human capital and as such the contribution of structural capital in achieving better intellectual efficiency. Hence, the analyses of this study provide partial support to the hypothesis 2, which implies companies with greater physical capital efficiency, human capital efficiency, and structural capital tend to have higher market-to-book value ratios, *ceteris paribus*.

Table 3A, 3B present standardized regression, and stepwise regression conducted on dependent variable financial performance, which considers ROE, ROA, GR, and EP. As found in the correlation analysis, value added intellectual coefficient VAIC is not significantly related with the dependent variables of financial performance except GR. It suggests assuming that the traditional measures of the financial and accounting world do not represent the intellectual capability of the banks; rather VAIC is a better model to predict the future earnings feasibility of the banks. As in the correlation analysis, VAIC ( $p < .01$ ) is significantly related with GR. VAIC can predict the variability in revenue growth of the bank by 44.1%, and the rest of the variability can be better explained by the other variables not considered in this study. Therefore, it can be concluded that hypothesis 3, which implies companies with greater intellectual capital tend to have better financial performance, *ceteris paribus*, is supported by the analyses conducted to a lower degree.

Table 3A also shows the regression analysis of HCE, CEE, and SCE on the financial performance of the bank. It shows CEE ( $p < .001$ ) is significantly related with ROE, and CEE ( $p < .05$ ) is also reported to be significantly related with ROA. The other two components of VAIC (HCE & SCE) are found not to be significantly related with any of the dependent variables under financial performance. It is a bit different scenario from what is found in the correlation analysis. Again, stepwise regression analysis in Table 3B shows another scenario. As found before in the standardized regression analysis, CEE ( $p < .001$  &  $p < .01$ ) is significantly related with ROE and ROA respectively. However, HCE ( $p < .01$ ) is found to be significantly related with GR, and SCE ( $p < .05$ ) is found to be significantly related with EP. The findings from stepwise regression analysis imply bank with higher physical capital may earn better ROA and ROE, however, future revenue growth and employee productivity depend on the formation of efficient human capital and effective structural capital. On the other hand, in Table 3A, it is found that the value of  $R^2$  remarkably increases from Panel 1 to Panel 2. It suggests believing that the three components of VAIC are better of explaining the financial performance of the banks compared to the aggregate measure of VAIC. The conducted analyses of the study, to a lower degree, supports the hypothesis 4, which implies companies with greater physical capital efficiency, human capital efficiency, and structural capital efficiency tend to have better financial performance, *ceteris paribus*.

Empirical findings fail to find any strong association between all the independent and dependent variables. VAIC and its three components are found to be able to represent the Market-to-book ratios of the banks; however, these independent variables cannot explain the dependent variables under financial performance in full mode. This study provides a keen insight regarding the perception of the investors of Bangladesh. The investors value a bank based on its physical assets by not considering its structural capital efficiency and human capital efficiency. That is why capital employed efficiency (physical capital efficiency) is found to be significantly related with the Market-to-book ratios of the banks. A possible explanation for the lack of strong association between VAIC and its three components and financial performance of the banks is banks in Bangladesh is trying to increase productivity through the employment of tangible assets placing less effort into utilizing its human resource base. Again, the concepts of value added and banks' profitability (in a sense of ROE and ROA) are two distinct and completely dissimilar dimensions of corporate performance. The concept of firm's profitability is of financial in nature and as such focuses on returns to the firm's owner only, whereas the former one defines the contribution to the overall increase in potential and wealth to the various stakeholders of the firm other than just owner.

## 8. CONCLUSION

As the world is moving into globalization, investors need non financial disclosure besides financial measures to assist them in their decision making. Say for example, if the company has fulfilled its social obligation towards the community or take a stance on incorporating healthy environmental and safety measures in the company, then such information if disclosed, will enhance its value in the eyes of the investors. Similarly, companies that have invested in IC will stand to gain if such information is disclosed either qualitatively or quantitatively in the financial statement as required by the accounting standards. However, huge investment flows in intangibles do not appear as positive asset values on financial statements, so the traditional accounting model does not represent them in a meaningful format. But financial statements should be seen as only a part of the jigsaw in how companies access and communicate value. The finance function has a key role to play in managing knowledge assets and understanding and communicating sources of firm's value. It may take a while to reach a consensus on what constitutes the best model for managing and reporting intangible value drivers. But experimentation is invaluable if all are to agree on the best practice and arrive at a point of convergence between the disparate approaches.

## APPENDIX

## Appendix – 1

## CALCULATION OF MARKET – TO – BOOK VALUE RATIOS

Name of the Bank	No. of out standing shares	Stock price at the end of the year	Market value	Book Value of stockholders' equity	Book value of common stocks	M/B	Stock price at the end of the year	P/E	EPS
AB Bank	4950129.00	381.08	1886397634.38	1243576774.94	1243576774.94	1.52	381.08	20.95	18.19
Al-Arafah Islami Bank	586960.00	3229.96	1895855854.20	957263069.00	957263069.00	1.98	3229.96	12.25	263.67
Bank Asia Ltd.	7440000.00	731.56	5442839136.00	1183470691.00	1183470691.00	4.60	731.56	18.53	39.48
City Bank	4800000.00	877.76	4213236480.00	1417472736.00	1417472736.00	2.97	877.76	11.08	79.22
Dhaka Bank	6638362.00	849.80	5641260776.35	1487887362.00	1487887362.00	3.79	849.80	14.03	60.57
Dutch-Bangla Bank	2021350.00	1851.00	3741522690.57	978383394.00	978383394.00	3.82	1851.00	15.83	116.93
Eastern Bank	8280000.00	779.96	6458042304.00	2630833535.00	2630833535.00	2.45	779.96	13.36	58.38
Exim Bank of Bangladesh	6277500.00	778.50	4887008640.00	1400004740.00	1400004740.00	3.49	778.50	12.80	60.82
IFIC Bank	4063860.00	406.92	1653650062.15	1215488893.00	1215488893.00	1.36	406.92	25.29	16.09
Islami Bank	2304000.00	4833.26	11135828275.20	6633919318.00	6633919318.00	1.68	4833.26	9.32	518.59
Mutual Trust Bank Ltd.	7200000.00	587.04	4226709600.00	1217545083.00	1217545083.00	3.47	587.04	17.10	34.33
NBL	5163279.00	475.18	2453486398.89	1862318021.00	1862318021.00	1.32	475.18	14.43	32.93
NCCBL	6078072.00	544.74	3310976234.97	1229622993.00	1229622993.00	2.69	544.74	11.61	46.92
One Bank Limited	6900000.00	198.81	1371789000.00	983908015.00	983908015.00	1.39	198.81	7.05	28.20
Oriental Bank Ltd.	519106.00	1654.64	858933551.84	(1517567117.00)	(1517567117.00)	(0.57)	1654.64	(3.44)	(481.00)
Prime Bank	10000000.00	879.30	8793003000.00	2239801912.00	2239801912.00	3.93	879.30	14.37	61.19
Rupali Bank	12500000.00	292.74	3659205000.00	(611822528.00)	(611822528.00)	(5.98)	292.74	6.62	44.22
Social Investment Bank	585000.00	3718.00	2175030000.00	915500974.00	915500974.00	2.38	3718.00	26.00	143.00
Southeast Bank	6771600.00	662.37	4485334487.04	1429437680.00	1429437680.00	3.14	662.37	15.22	43.52
Standard Bank Limited	7590000.00	457.42	3471839811.00	1099997590.00	1099997590.00	3.16	457.42	14.29	32.01
UCBL	2301576.08	1333.52	3069208091.29	1242884576.00	1242884576.00	2.47	1333.52	18.23	73.15
Uttara Bank	998324.00	2373.84	2369861444.16	1742410362.00	1742410362.00	1.36	2373.84	23.55	100.80

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